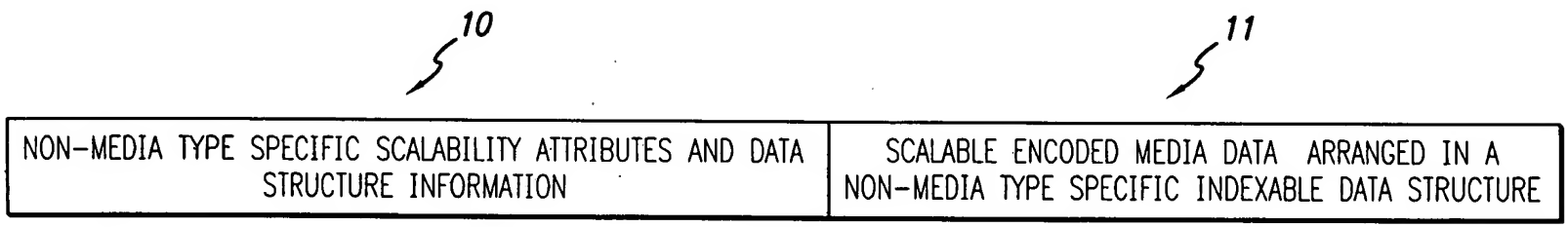

10
11
NON-MEDIA TYPE SPECIFIC SCALABILITY ATTRIBUTES AND DATA STRUCTURE INFORMATION
SCALABLE ENCODED MEDIA DATA ARRANGED IN A NON-MEDIA TYPE SPECIFIC INDEXABLE DATA STRUCTURE

FIG. 1

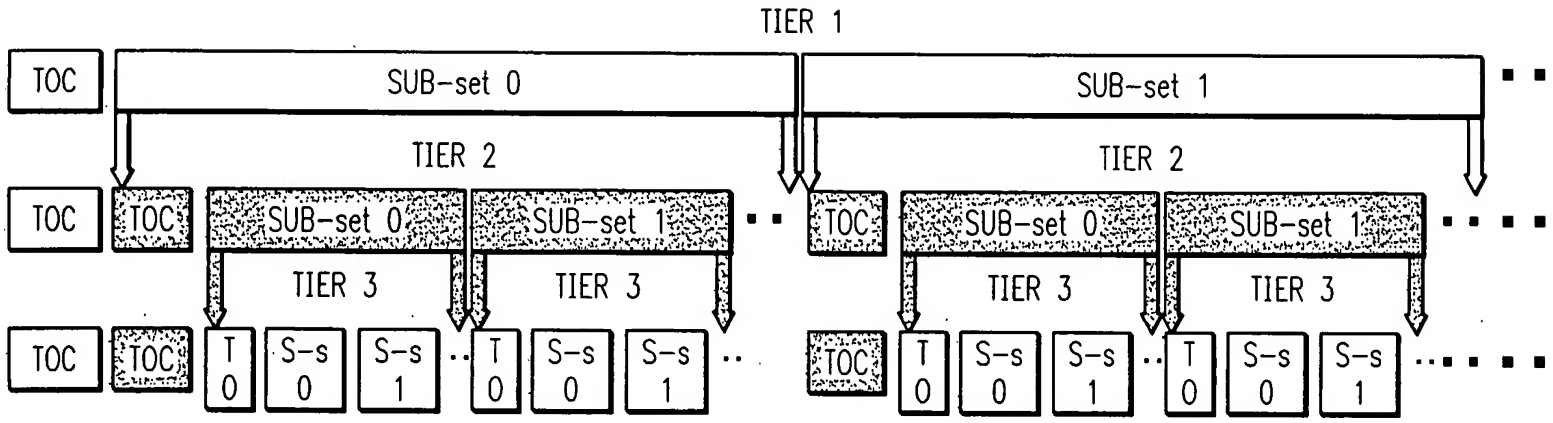

TIER 1
TOC
SUB-set 0
SUB-set 1
TIER 2
TOC
TOC
SUB-set 0
SUB-set 1
TOC
SUB-set 0
SUB-set 1
TIER 3
TIER 3
TIER 3
TIER 3
TOC
TOC
T 0
S-s 0
S-s 1
T 0
S-s 0
S-s 1
TOC
T 0
S-s 0
S-s 1
T 0
S-s 0
S-s 1

FIG. 2A

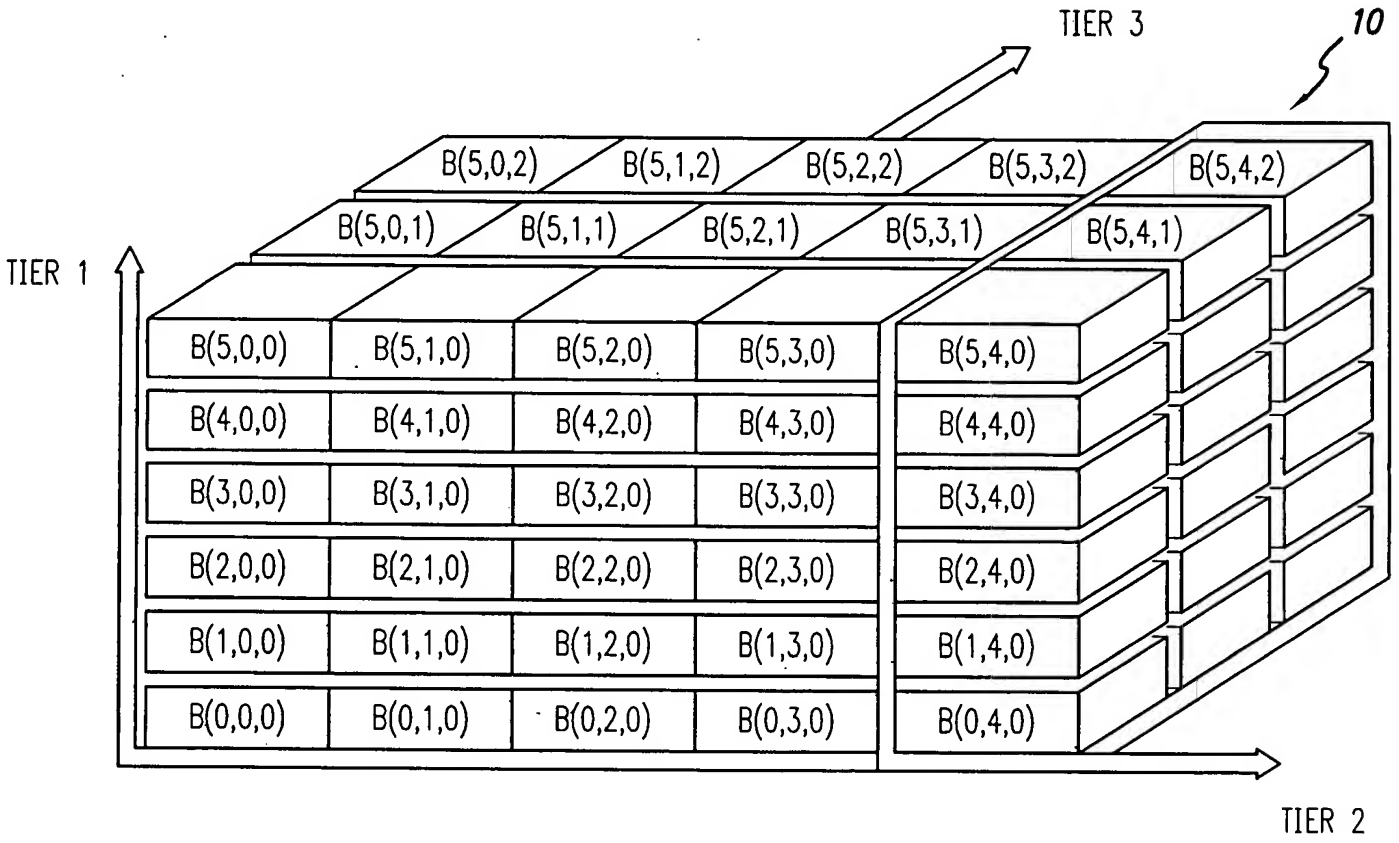

TIER 3
10
TIER 1
B(5,0,2)
B(5,1,2)
B(5,2,2)
B(5,3,2)
B(5,4,2)
B(5,0,1)
B(5,1,1)
B(5,2,1)
B(5,3,1)
B(5,4,1)
B(5,0,0)
B(5,1,0)
B(5,2,0)
B(5,3,0)
B(5,4,0)
B(4,0,0)
B(4,1,0)
B(4,2,0)
B(4,3,0)
B(4,4,0)
B(3,0,0)
B(3,1,0)
B(3,2,0)
B(3,3,0)
B(3,4,0)
B(2,0,0)
B(2,1,0)
B(2,2,0)
B(2,3,0)
B(2,4,0)
B(1,0,0)
B(1,1,0)
B(1,2,0)
B(1,3,0)
B(1,4,0)
B(0,0,0)
B(0,1,0)
B(0,2,0)
B(0,3,0)
B(0,4,0)
TIER 2

FIG. 2B

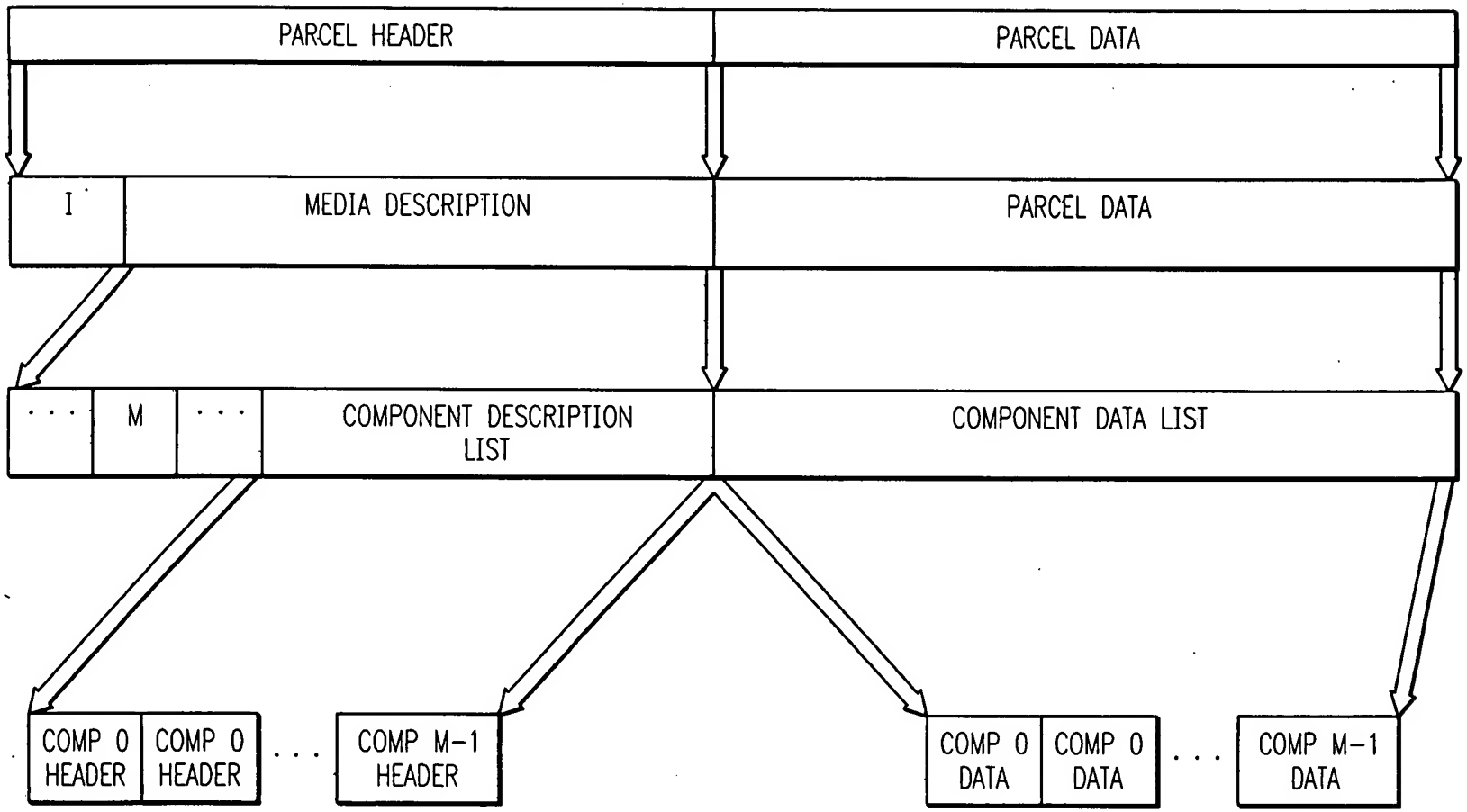

PARCEL HEADER
PARCEL DATA
I
MEDIA DESCRIPTION
PARCEL DATA
. . .
M
. . .
COMPONENT DESCRIPTION LIST
COMPONENT DATA LIST
COMP 0 HEADER
COMP 0 HEADER
. . .
COMP M-1 HEADER
COMP 0 DATA
COMP 0 DATA
. . .
COMP M-1 DATA

FIG. 3A

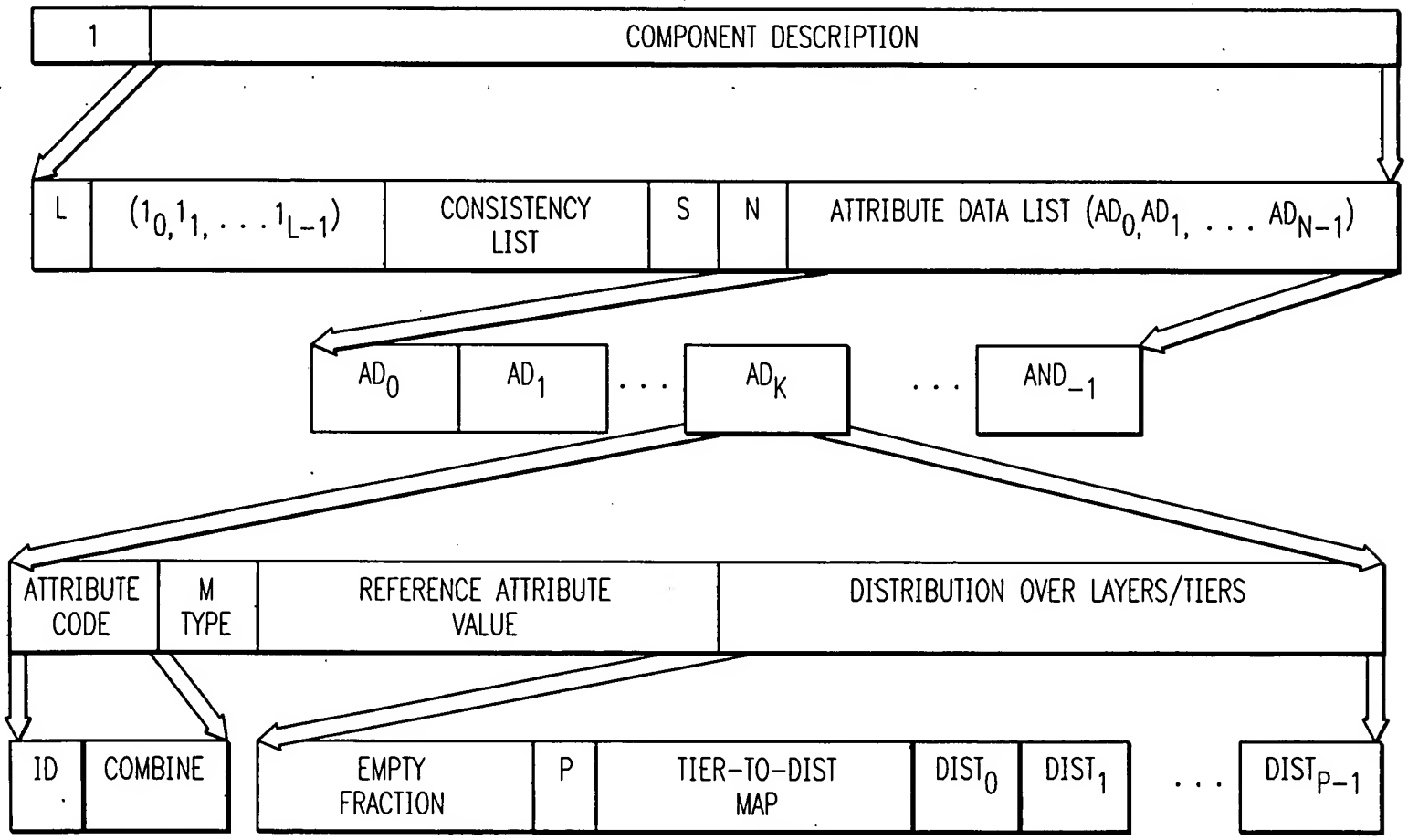

1
COMPONENT DESCRIPTION
L
$(1_0, 1_1, \ldots 1_{L-1})$
CONSISTENCY LIST
S
N
ATTRIBUTE DATA LIST $(AD_0, AD_1, \ldots AD_{N-1})$
AD_0
AD_1
AD_K
AND_{-1}
ATTRIBUTE CODE
M TYPE
REFERENCE ATTRIBUTE VALUE
DISTRIBUTION OVER LAYERS/TIERS
ID
COMBINE
EMPTY FRACTION
P
TIER-TO-DIST MAP
$DIST_0$
$DIST_1$
$DIST_{P-1}$

FIG. 3B

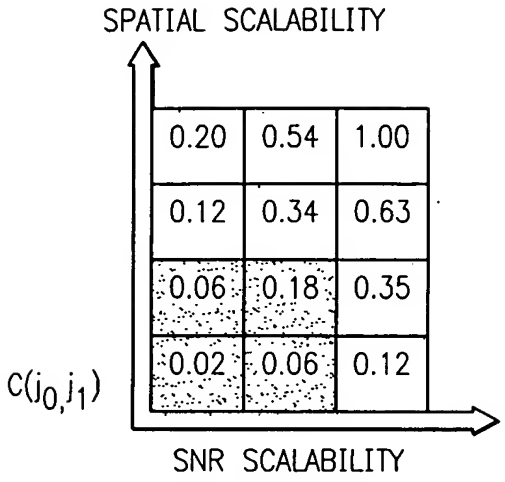


FIG. 3C

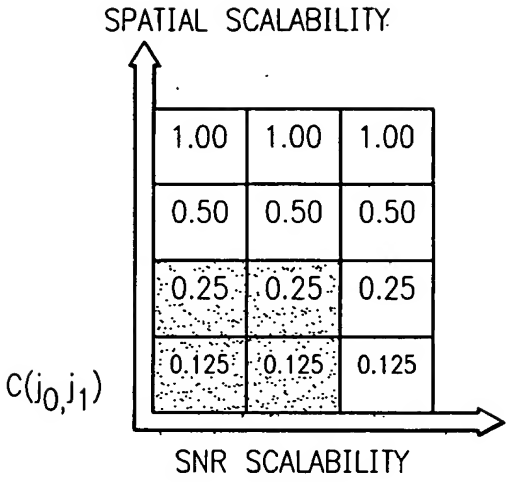


FIG. 3D

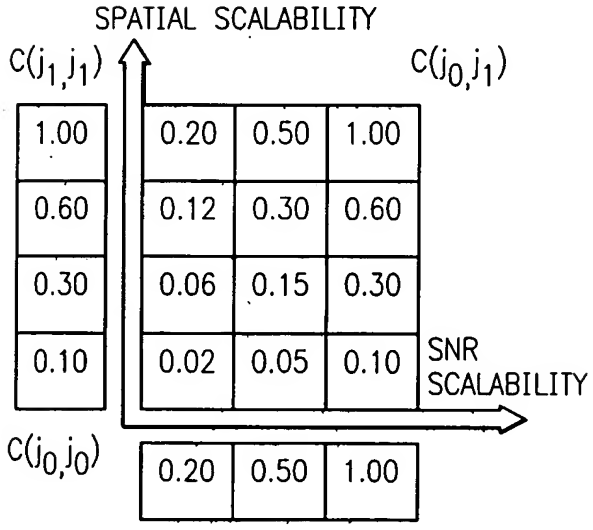


FIG. 3E

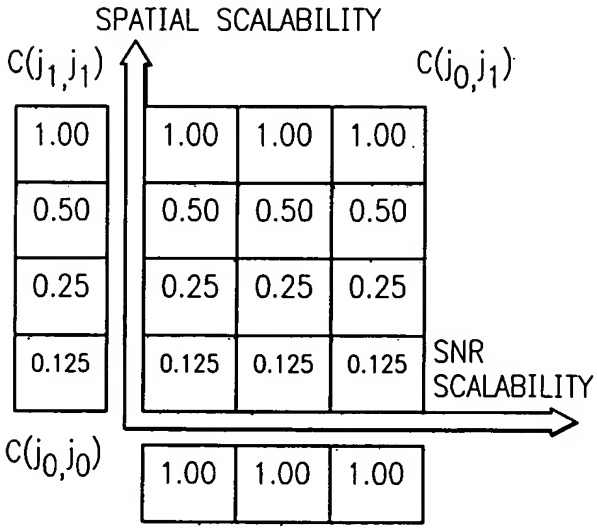


FIG. 3F

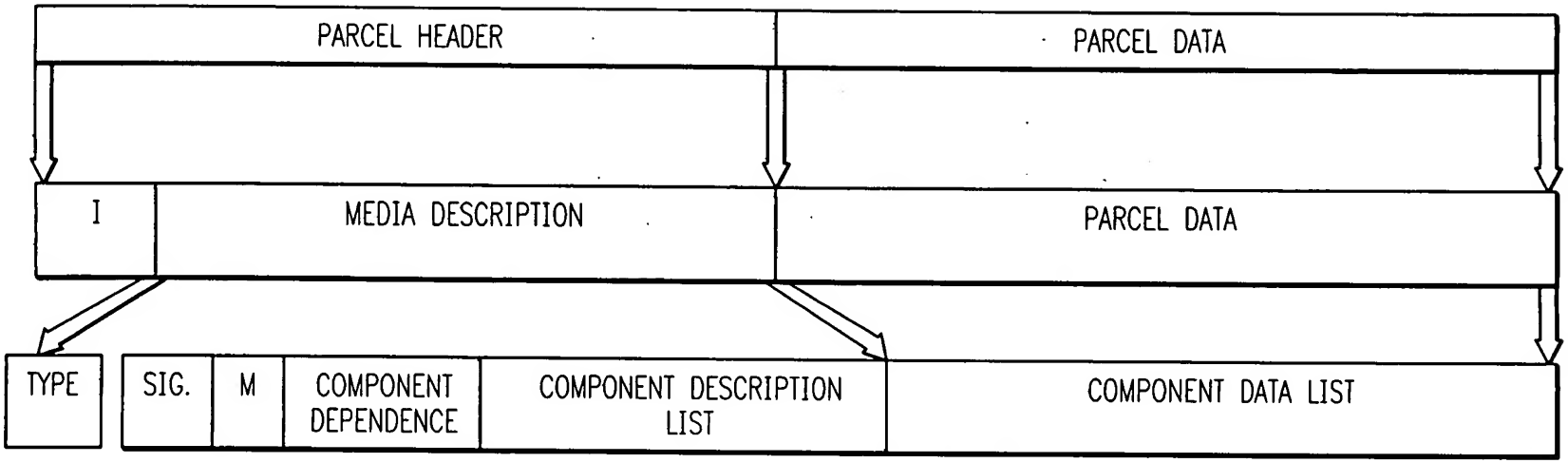


FIG. 4A

$$D=\begin{Bmatrix} d_{00} & d_{01} & d_{02} & \cdots & d_{0,M-1} \\ d_{10} & d_{11} & d_{12} & \cdots & d_{1,M-1} \\ d_{20} & d_{21} & d_{22} & \cdots & d_{2,M-1} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ & & & d_{pp} \cdots d_{pq} & \\ \vdots & \vdots & \vdots & & \vdots \\ d_{M0} & d_{M1} & d_{M2} & \cdots & d_{M-1,M-1} \end{Bmatrix}$$

FIG. 4B

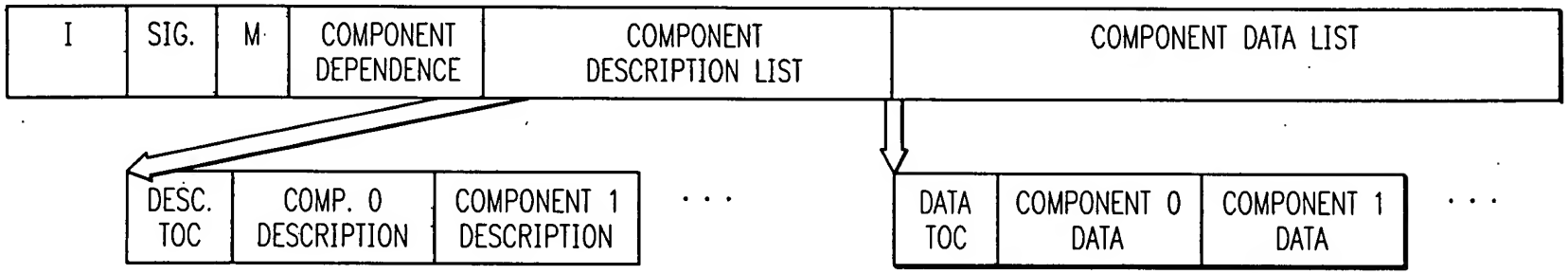


FIG. 5A

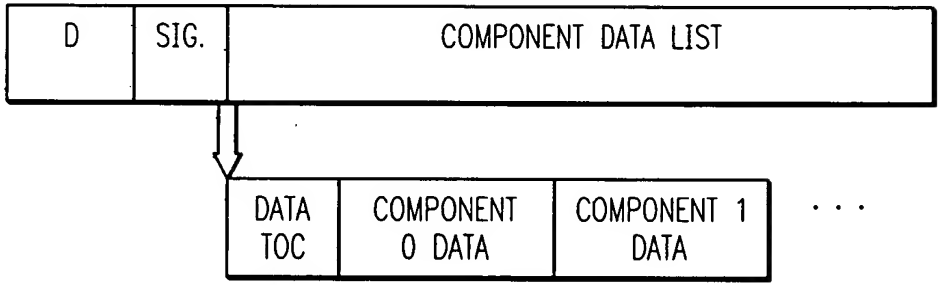


FIG. 5B

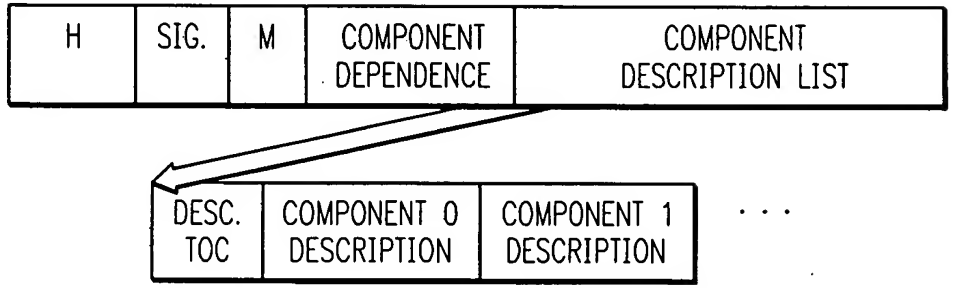


FIG. 5C

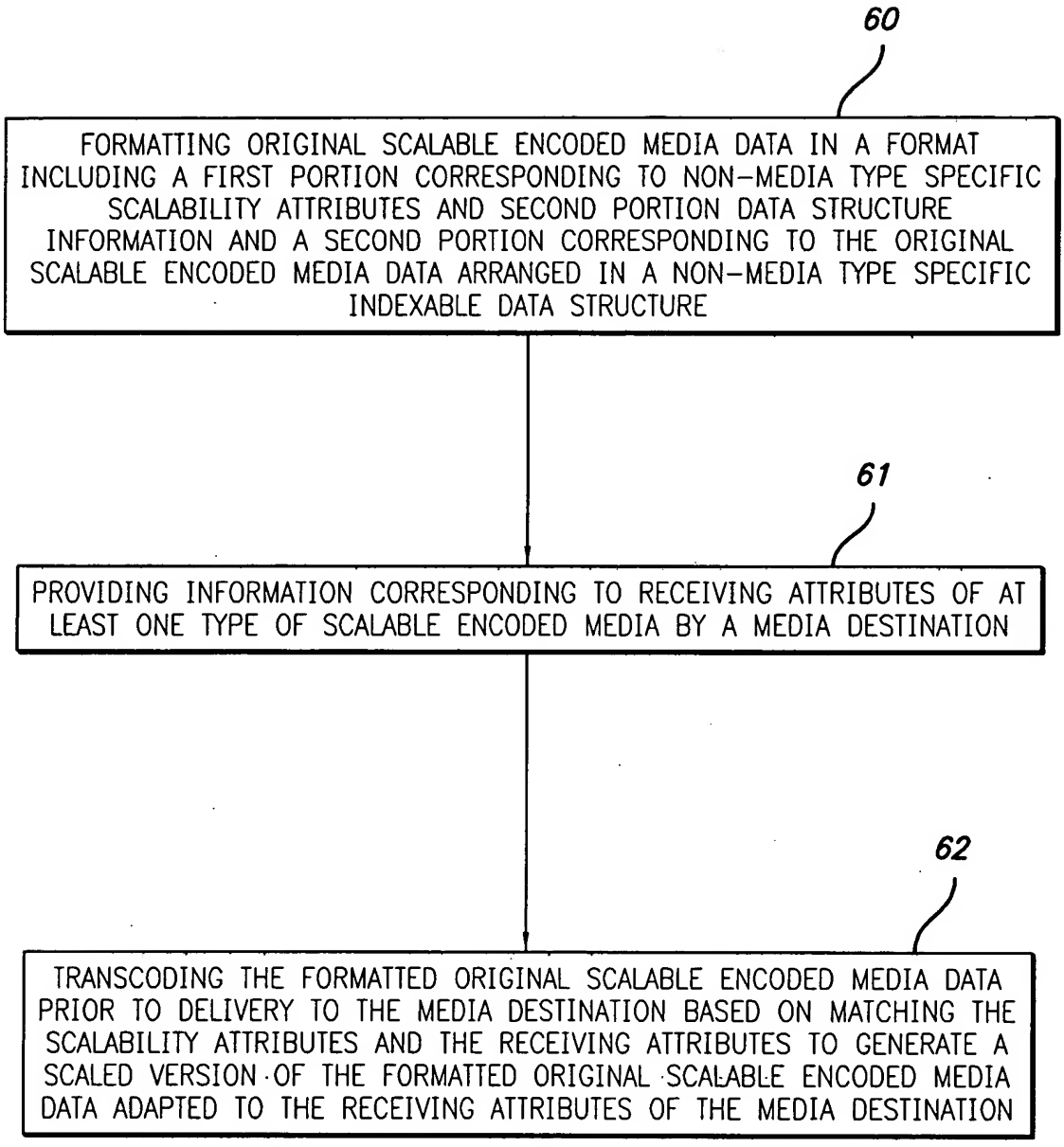

60
FORMATTING ORIGINAL SCALABLE ENCODED MEDIA DATA IN A FORMAT INCLUDING A FIRST PORTION CORRESPONDING TO NON-MEDIA TYPE SPECIFIC SCALABILITY ATTRIBUTES AND SECOND PORTION DATA STRUCTURE INFORMATION AND A SECOND PORTION CORRESPONDING TO THE ORIGINAL SCALABLE ENCODED MEDIA DATA ARRANGED IN A NON-MEDIA TYPE SPECIFIC INDEXABLE DATA STRUCTURE
61
PROVIDING INFORMATION CORRESPONDING TO RECEIVING ATTRIBUTES OF AT LEAST ONE TYPE OF SCALABLE ENCODED MEDIA BY A MEDIA DESTINATION
62
TRANSCODING THE FORMATTED ORIGINAL SCALABLE ENCODED MEDIA DATA PRIOR TO DELIVERY TO THE MEDIA DESTINATION BASED ON MATCHING THE SCALABILITY ATTRIBUTES AND THE RECEIVING ATTRIBUTES TO GENERATE A SCALED VERSION OF THE FORMATTED ORIGINAL SCALABLE ENCODED MEDIA DATA ADAPTED TO THE RECEIVING ATTRIBUTES OF THE MEDIA DESTINATION

FIG. 6

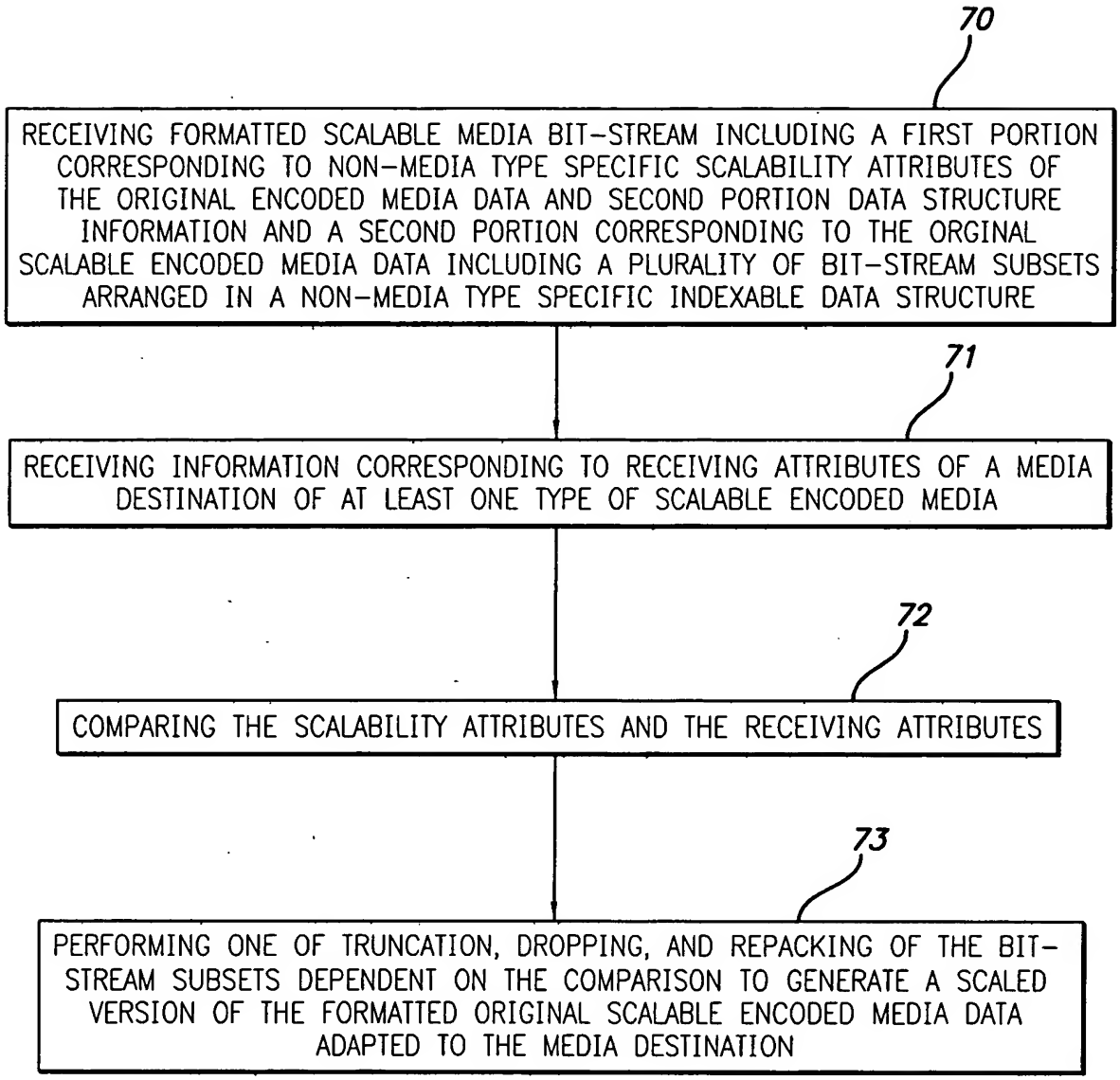

70
RECEIVING FORMATTED SCALABLE MEDIA BIT-STREAM INCLUDING A FIRST PORTION CORRESPONDING TO NON-MEDIA TYPE SPECIFIC SCALABILITY ATTRIBUTES OF THE ORIGINAL ENCODED MEDIA DATA AND SECOND PORTION DATA STRUCTURE INFORMATION AND A SECOND PORTION CORRESPONDING TO THE ORGINAL SCALABLE ENCODED MEDIA DATA INCLUDING A PLURALITY OF BIT-STREAM SUBSETS ARRANGED IN A NON-MEDIA TYPE SPECIFIC INDEXABLE DATA STRUCTURE
71
RECEIVING INFORMATION CORRESPONDING TO RECEIVING ATTRIBUTES OF A MEDIA DESTINATION OF AT LEAST ONE TYPE OF SCALABLE ENCODED MEDIA
72
COMPARING THE SCALABILITY ATTRIBUTES AND THE RECEIVING ATTRIBUTES
73
PERFORMING ONE OF TRUNCATION, DROPPING, AND REPACKING OF THE BIT-STREAM SUBSETS DEPENDENT ON THE COMPARISON TO GENERATE A SCALED VERSION OF THE FORMATTED ORIGINAL SCALABLE ENCODED MEDIA DATA ADAPTED TO THE MEDIA DESTINATION

FIG. 7

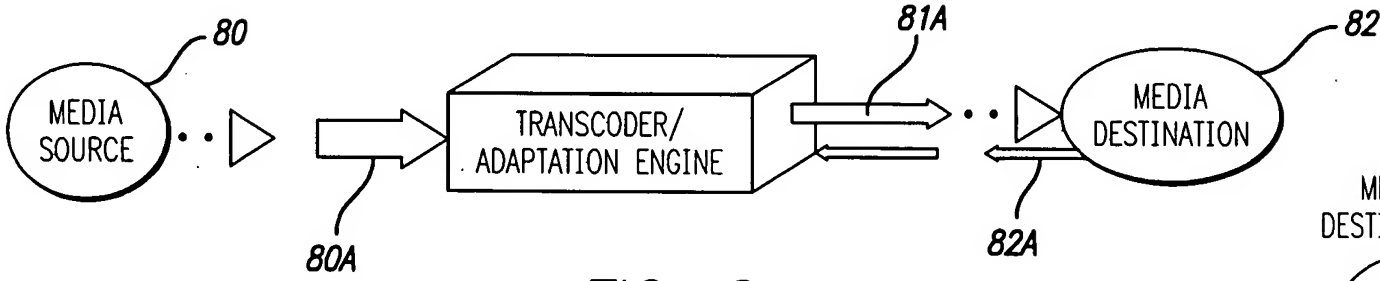

80
MEDIA SOURCE
80A
TRANSCODER/ ADAPTATION ENGINE
81A
82A
82
MEDIA DESTINATION

FIG. 8

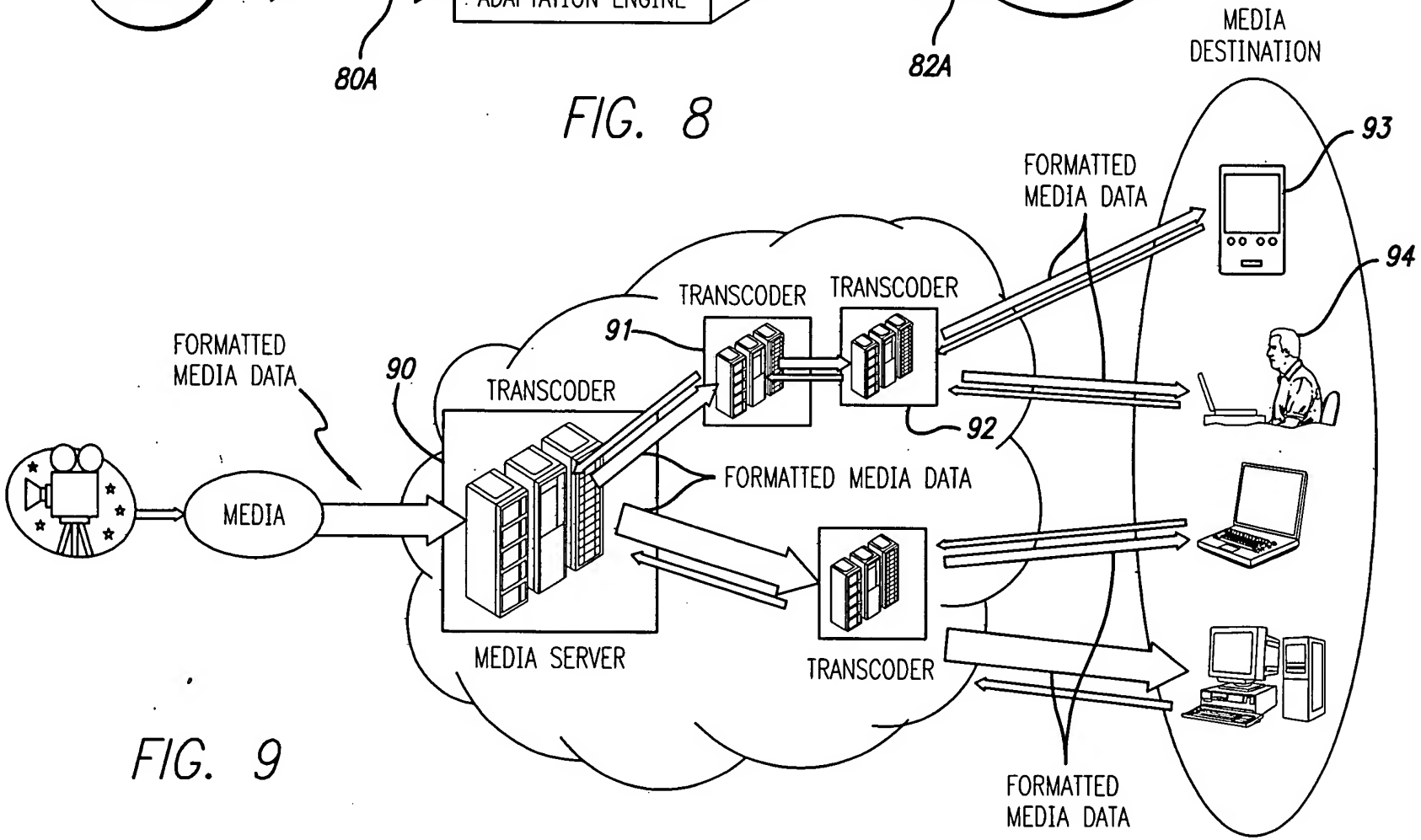

MEDIA DESTINATION
93
FORMATTED MEDIA DATA
94
TRANSCODER
TRANSCODER
91
FORMATTED MEDIA DATA
90
TRANSCODER
92
MEDIA
FORMATTED MEDIA DATA
MEDIA SERVER
TRANSCODER
FORMATTED MEDIA DATA

FIG. 9

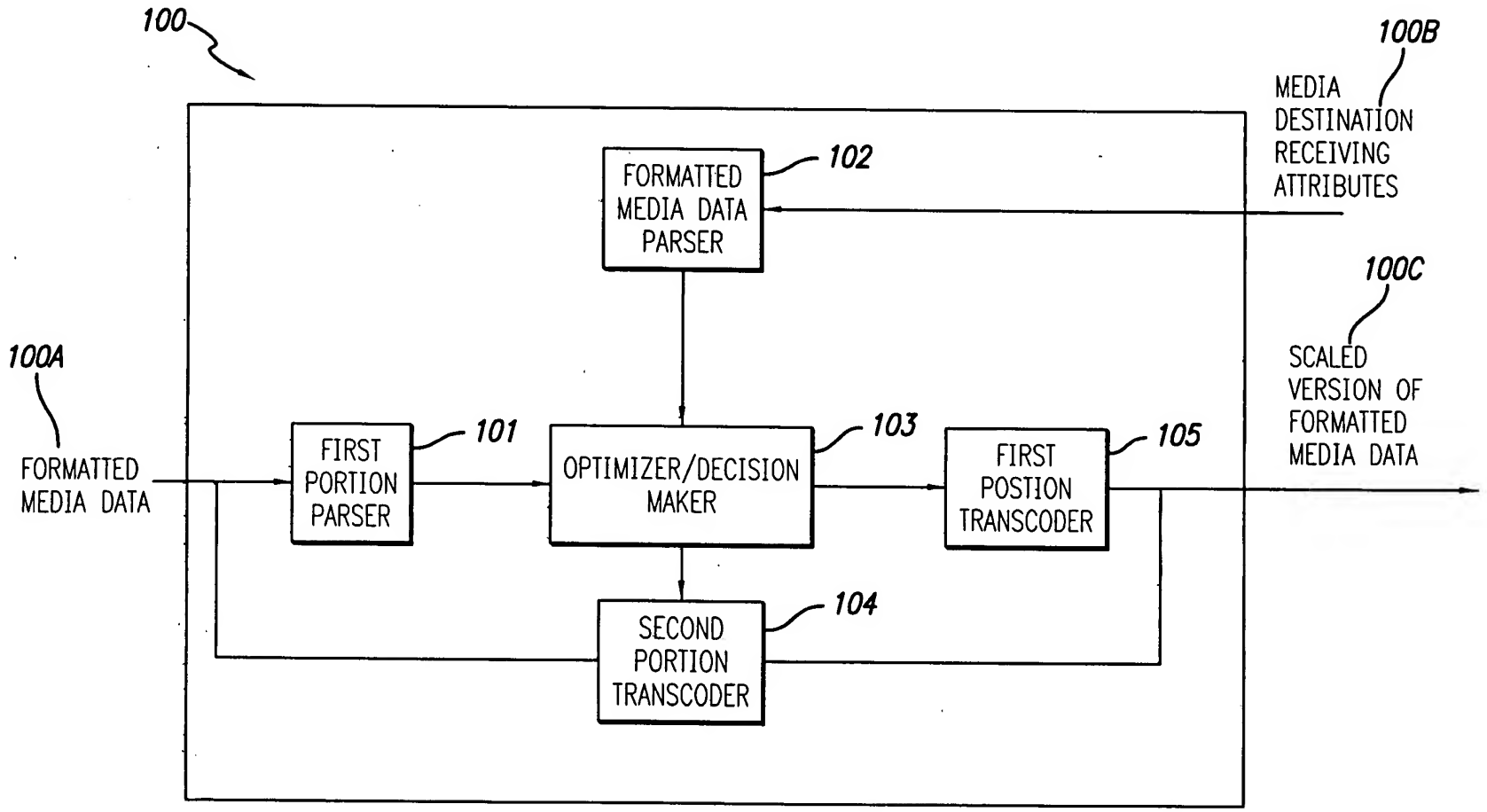

100
100B
MEDIA DESTINATION RECEIVING ATTRIBUTES
FORMATTED MEDIA DATA PARSER
102
100C
SCALED VERSION OF FORMATTED MEDIA DATA
100A
FORMATTED MEDIA DATA
FIRST PORTION PARSER
101
OPTIMIZER/DECISION MAKER
103
FIRST POSTION TRANSCODER
105
SECOND PORTION TRANSCODER
104

FIG. 10

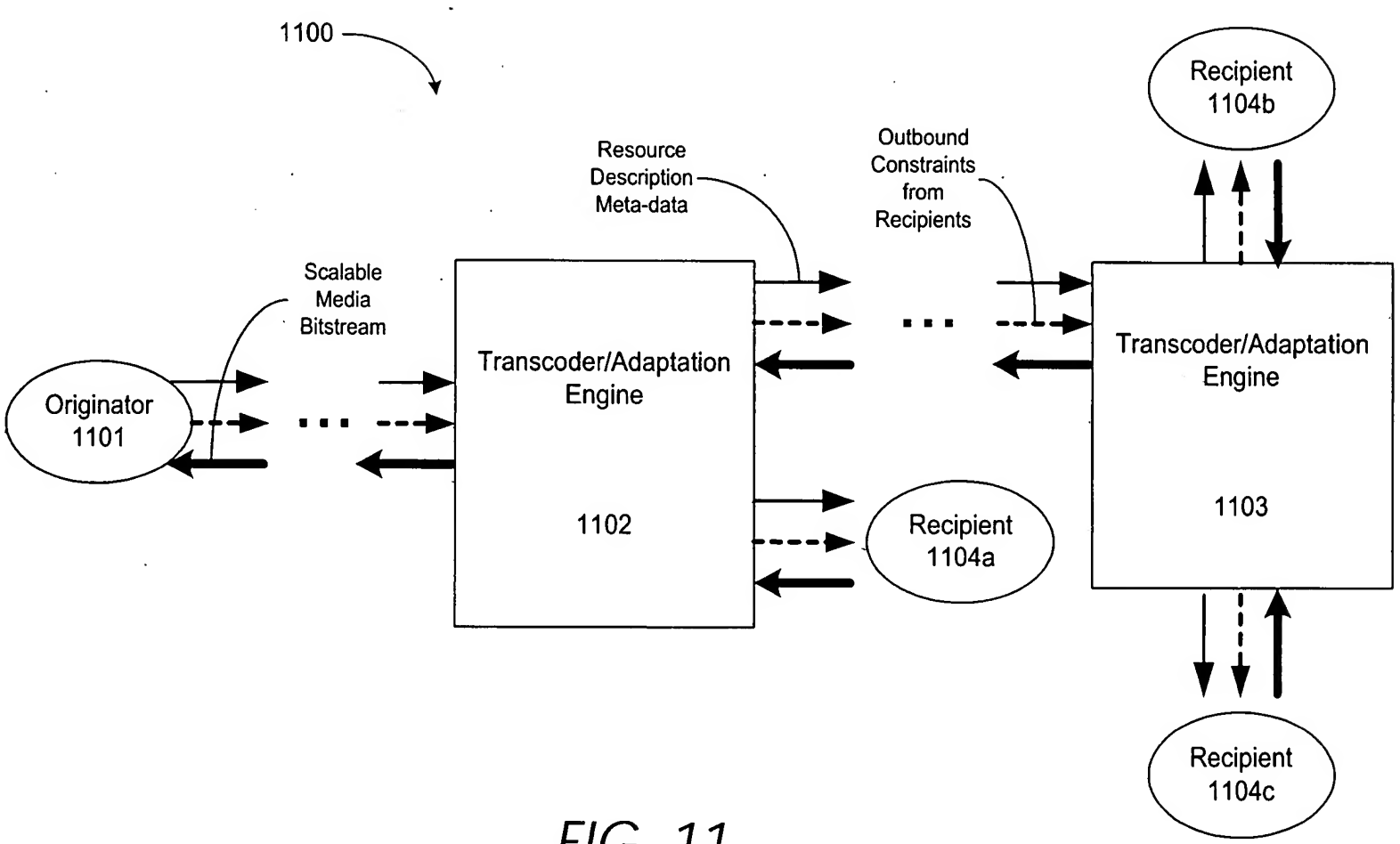

1100
Recipient
1104b
Resource
Description
Meta-data
Outbound
Constraints
from
Recipients
Scalable
Media
Bitstream
Originator
1101
Transcoder/Adaptation
Engine
1102
Recipient
1104a
Transcoder/Adaptation
Engine
1103
Recipient
1104c

FIG. 11

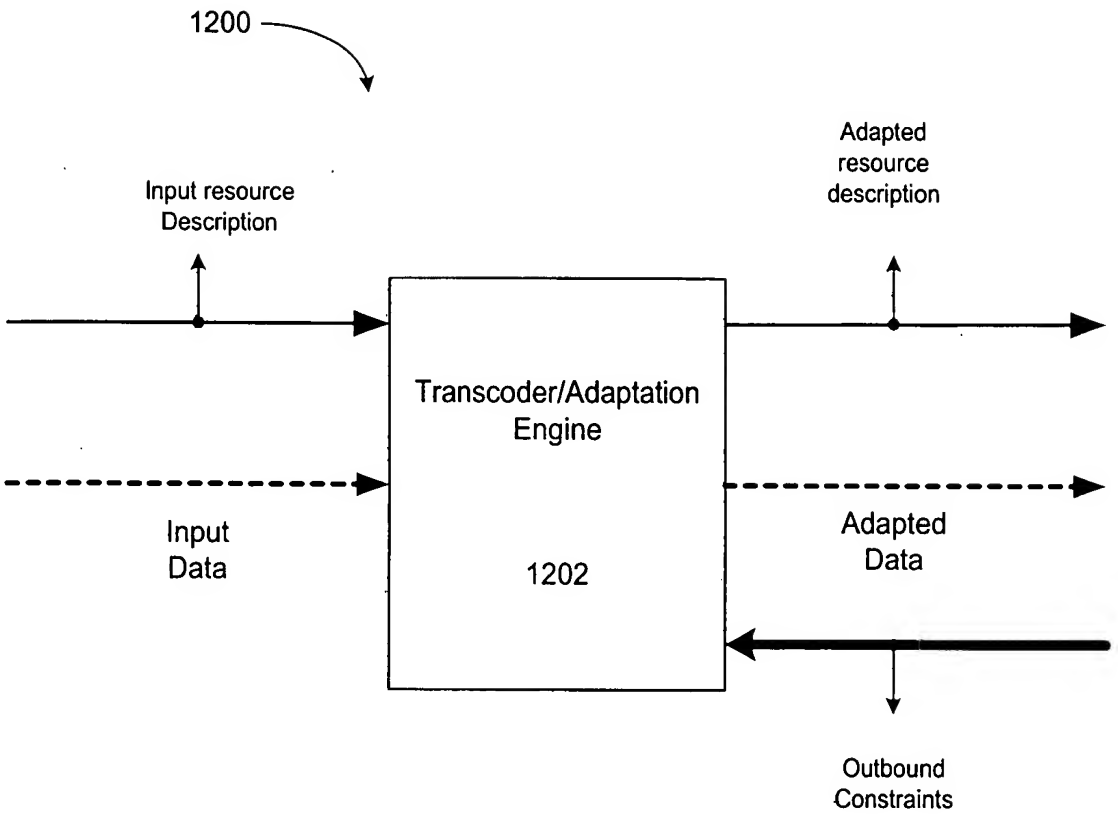

1200
Input resource Description
Adapted resource description
Transcoder/Adaptation Engine
1202
Input Data
Adapted Data
Outbound Constraints

FIG. 12

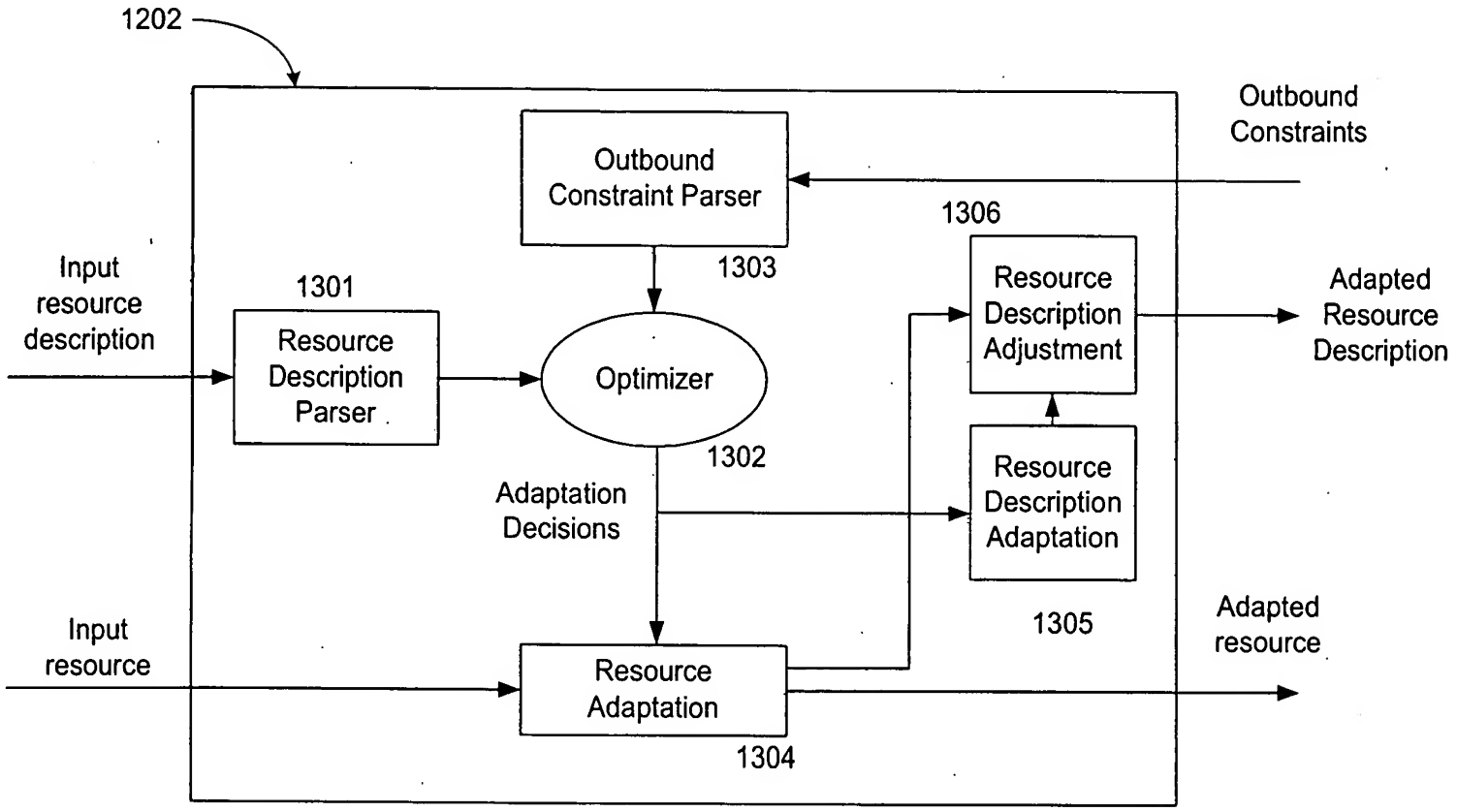

1202
Outbound Constraints
Outbound Constraint Parser
1303
1306
Input resource description
1301
Resource Description Parser
Optimizer
1302
Resource Description Adjustment
Adapted Resource Description
Resource Description Adaptation
Adaptation Decisions
1305
Input resource
Resource Adaptation
1304
Adapted resource

FIG. 13

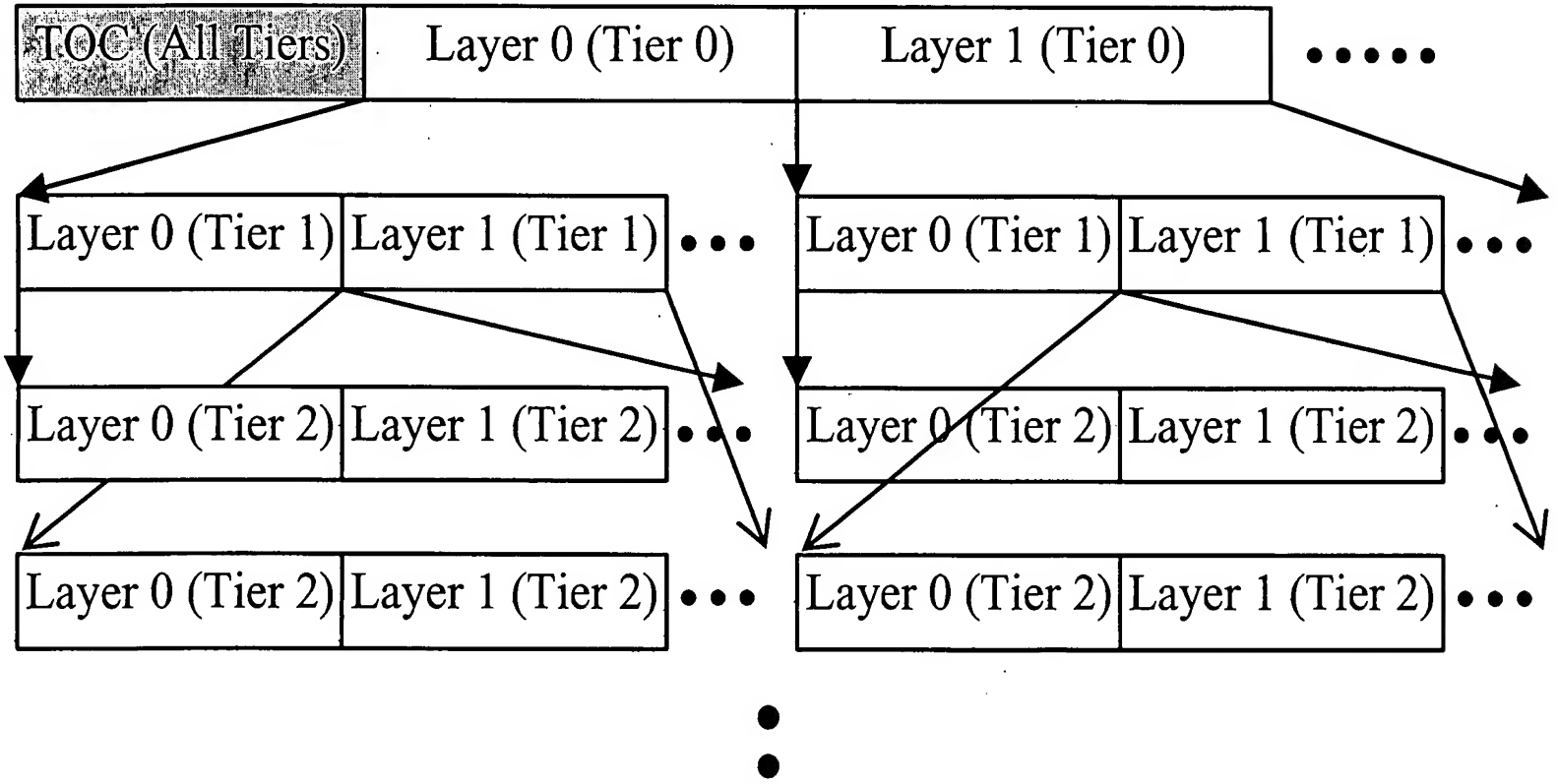

TOC (All Tiers)
Layer 0 (Tier 0)
Layer 1 (Tier 0)
Layer 0 (Tier 1)
Layer 1 (Tier 1)
Layer 0 (Tier 1)
Layer 1 (Tier 1)
Layer 0 (Tier 2)
Layer 1 (Tier 2)
Layer 0 (Tier 2)
Layer 1 (Tier 2)
Layer 0 (Tier 2)
Layer 1 (Tier 2)

FIG. 14

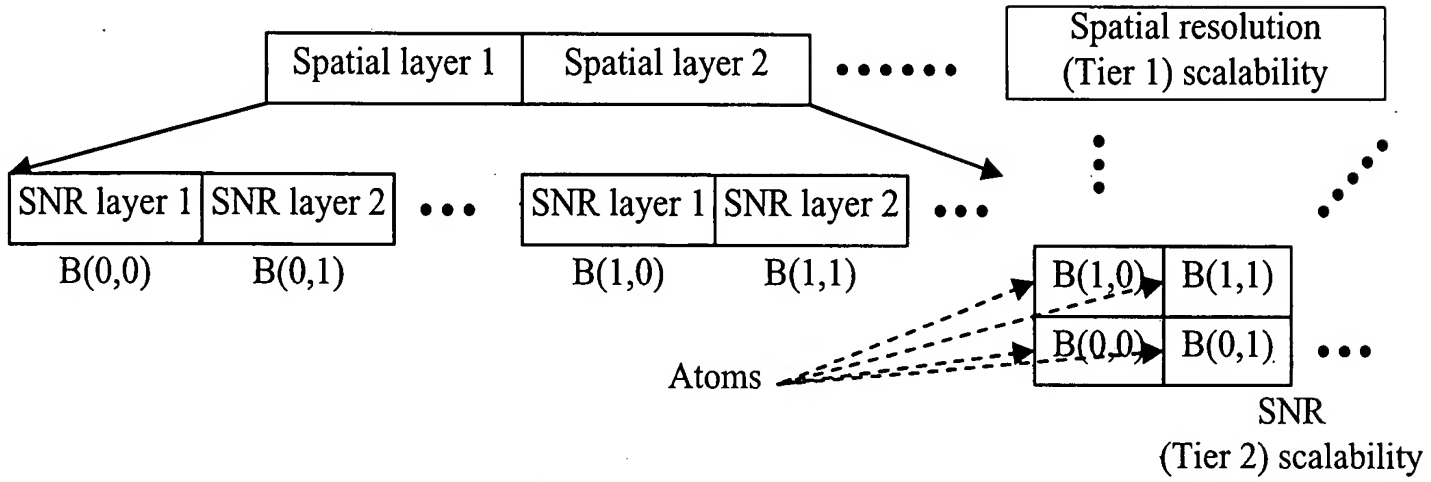
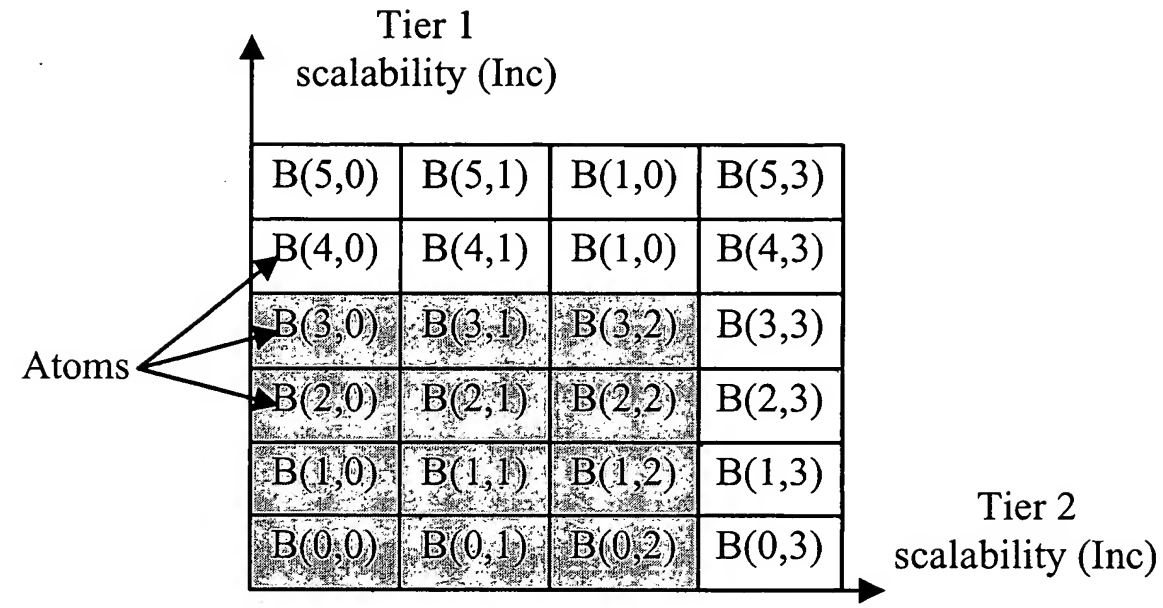

Spatial layer 1
Spatial layer 2
Spatial resolution
(Tier 1) scalability
SNR layer 1
SNR layer 2
SNR layer 1
SNR layer 2
B(0,0)
B(0,1)
B(1,0)
B(1,1)
B(1,0)
B(1,1)
B(0,0)
B(0,1)
Atoms
SNR
(Tier 2) scalability

FIG. 15

FIG. 16


Tier 1
scalability (Inc)
B(5,0) B(5,1) B(1,0) B(5,3)
B(4,0) B(4,1) B(1,0) B(4,3)
B(3,0) B(3,1) B(3,2) B(3,3)
B(2,0) B(2,1) B(2,2) B(2,3)
B(1,0) B(1,1) B(1,2) B(1,3)
B(0,0) B(0,1) B(0,2) B(0,3)
Atoms
Tier 2
scalability (Inc)

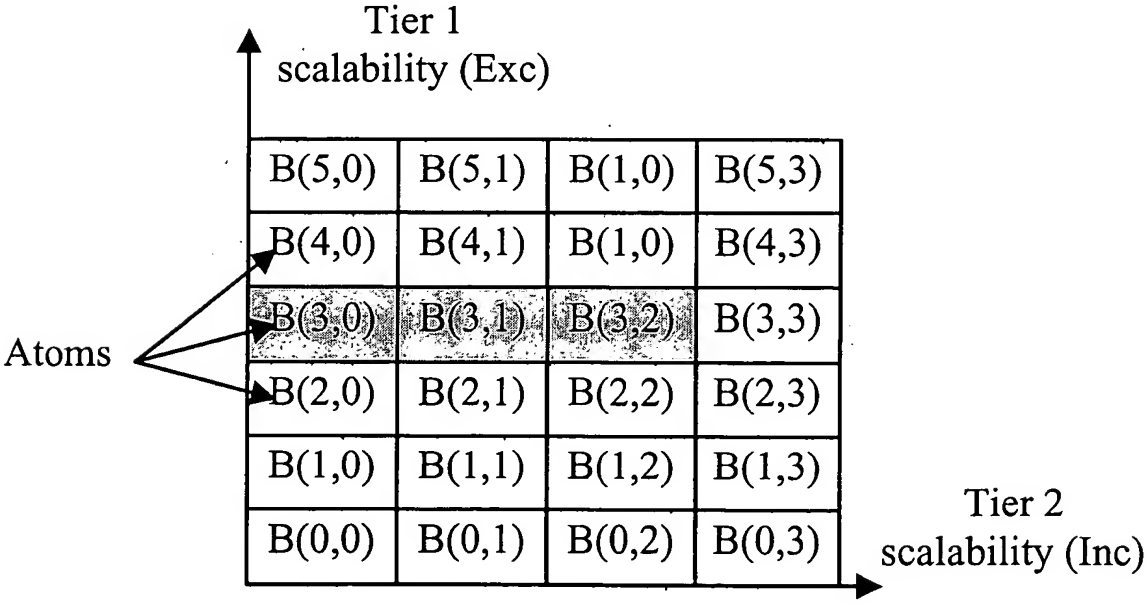

Tier 1
scalability (Exc)
B(5,0) B(5,1) B(1,0) B(5,3)
B(4,0) B(4,1) B(1,0) B(4,3)
B(3,0) B(3,1) B(3,2) B(3,3)
B(2,0) B(2,1) B(2,2) B(2,3)
B(1,0) B(1,1) B(1,2) B(1,3)
B(0,0) B(0,1) B(0,2) B(0,3)
Atoms
Tier 2
scalability (Inc)

FIG. 17

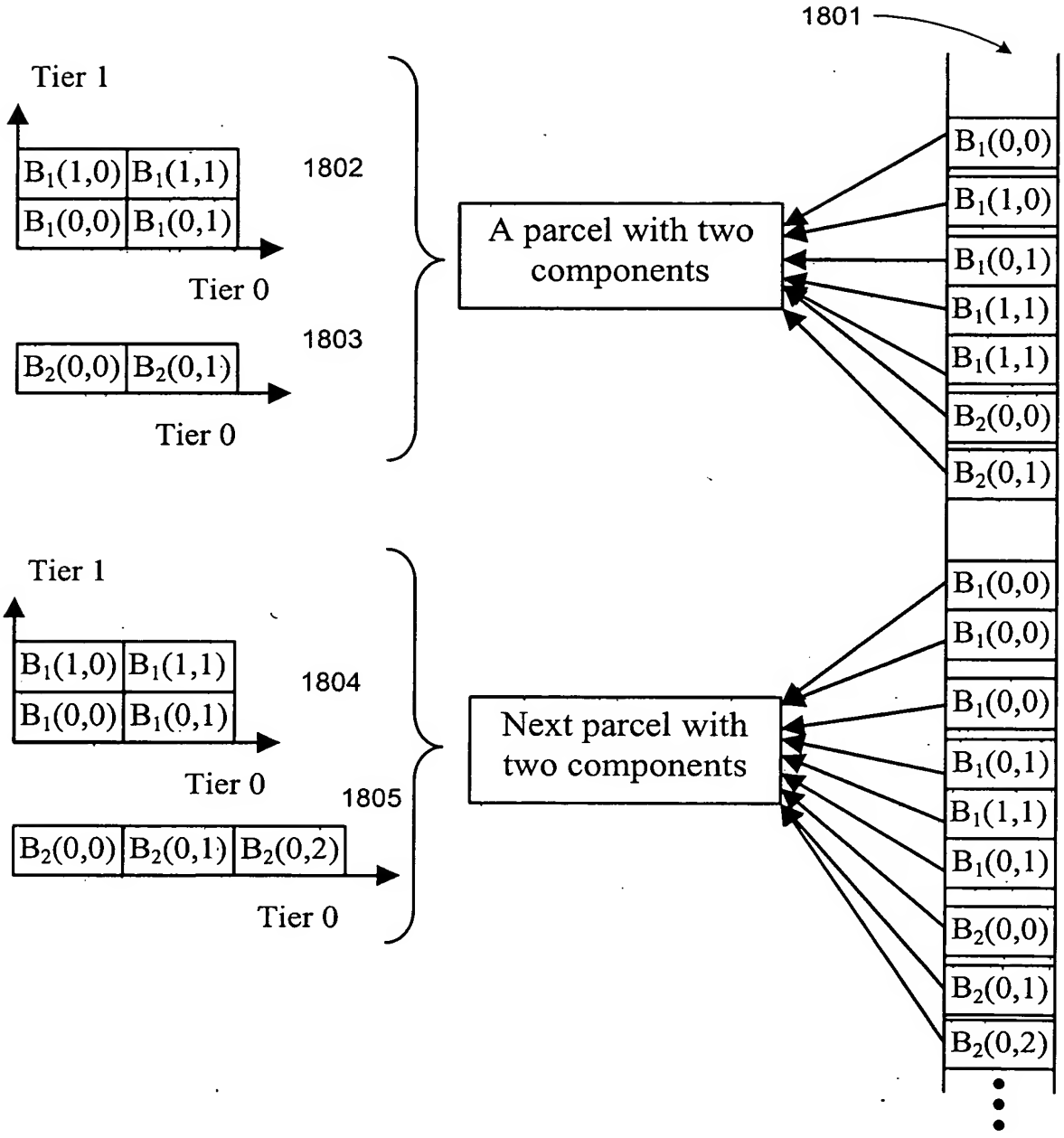

1801
Tier 1
B1(1,0) B1(1,1)
B1(0,0) B1(0,1)
1802
Tier 0
B2(0,0) B2(0,1)
1803
Tier 0
A parcel with two components
Tier 1
B1(1,0) B1(1,1)
B1(0,0) B1(0,1)
1804
Tier 0
B2(0,0) B2(0,1) B2(0,2)
1805
Tier 0
Next parcel with two components
B1(0,0)
B1(1,0)
B1(0,1)
B1(1,1)
B1(1,1)
B2(0,0)
B2(0,1)
B1(0,0)
B1(0,0)
B1(0,0)
B1(0,1)
B1(1,1)
B1(0,1)
B2(0,0)
B2(0,1)
B2(0,2)

FIG. 18

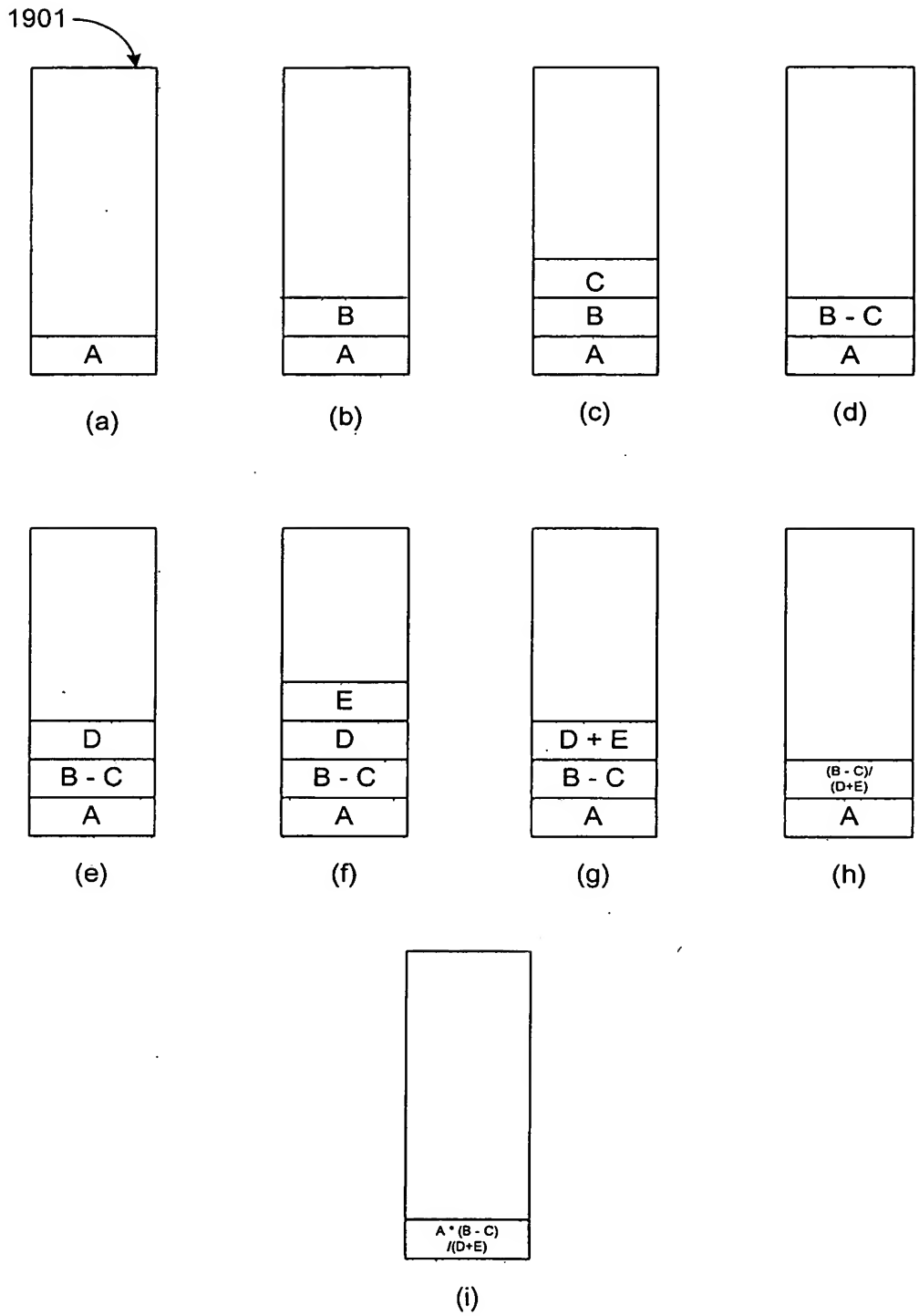


FIG. 19

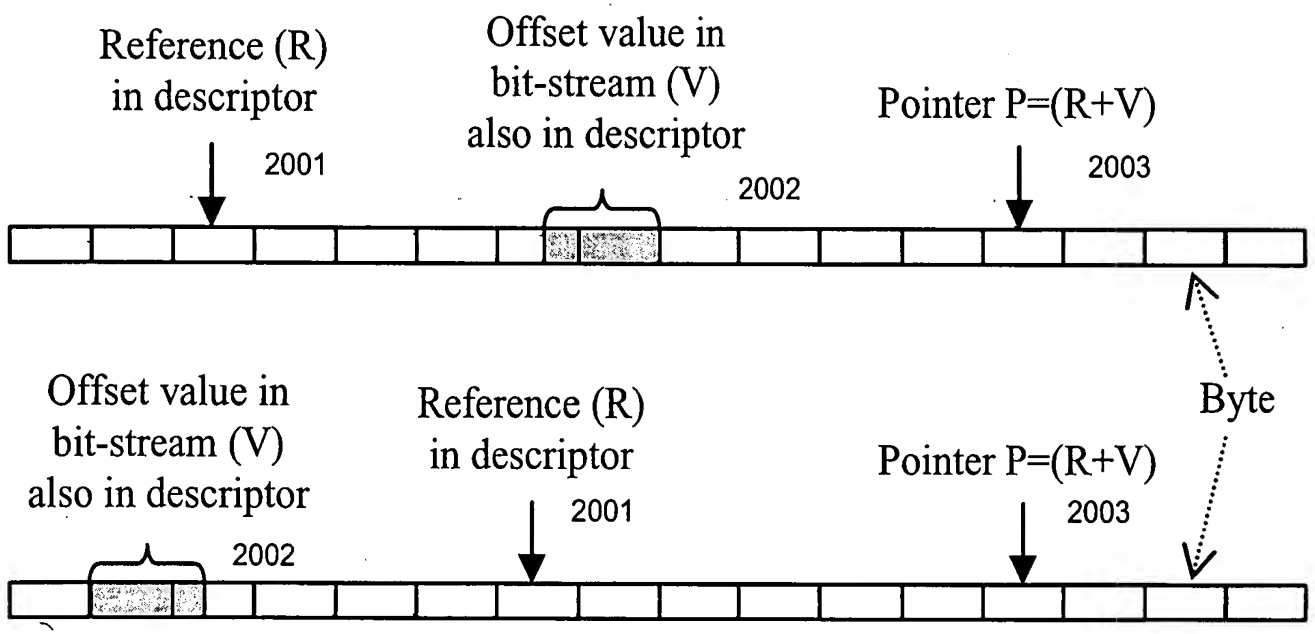

Reference (R)
in descriptor
2001
Offset value in
bit-stream (V)
also in descriptor
2002
Pointer P=(R+V)
2003
Byte
Offset value in
bit-stream (V)
also in descriptor
2002
Reference (R)
in descriptor
2001
Pointer P=(R+V)
2003

FIG. 20

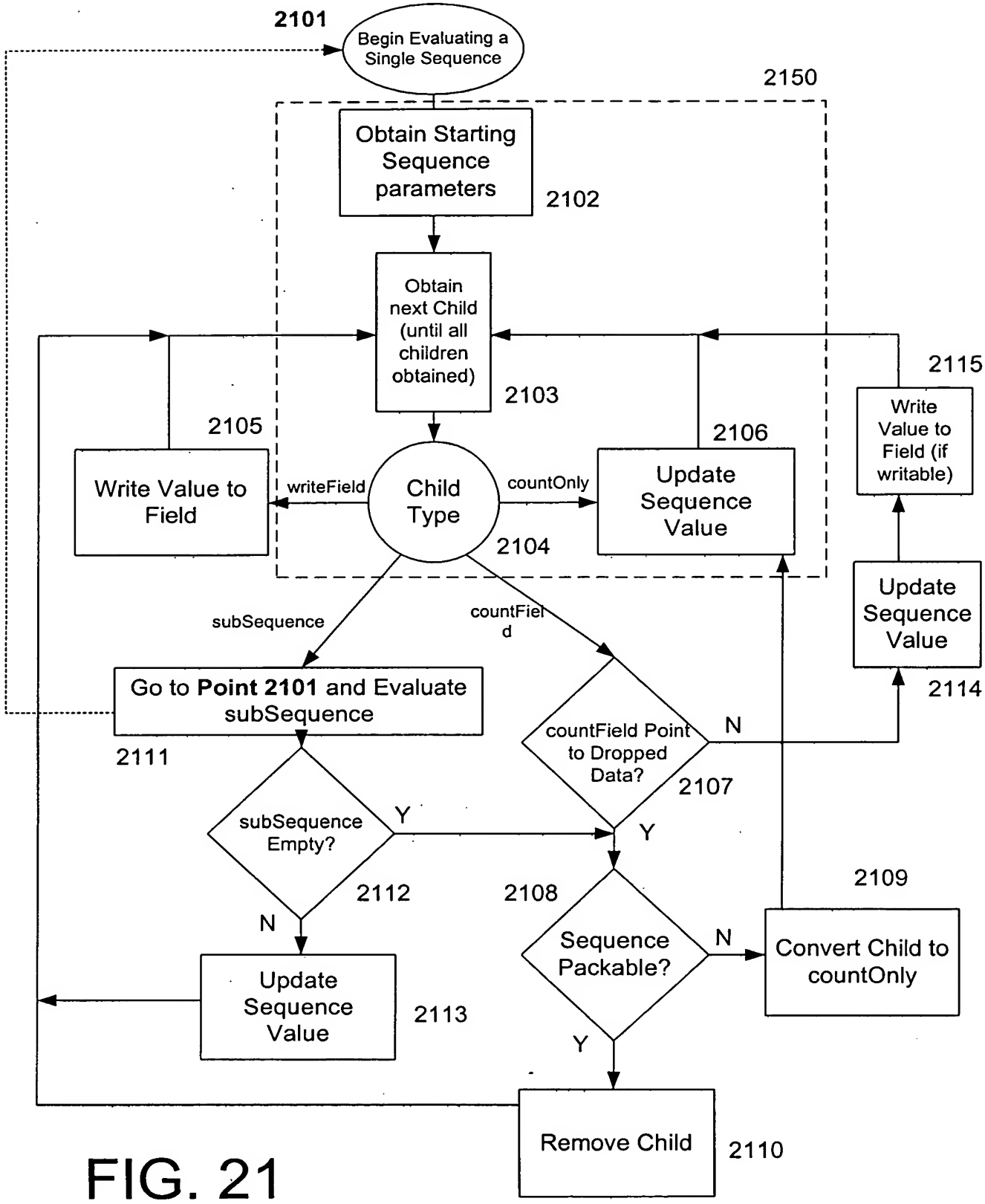

2101
Begin Evaluating a Single Sequence
2150
Obtain Starting Sequence parameters
2102
Obtain next Child (until all children obtained)
2103
2105
2106
2115
Write Value to Field
writeField
Child Type
countOnly
Update Sequence Value
Write Value to Field (if writable)
2104
subSequence
countFiel d
Update Sequence Value
2114
Go to Point 2101 and Evaluate subSequence
2111
countField Point to Dropped Data?
N
2107
subSequence Empty?
Y
Y
2112
2108
2109
N
Sequence Packable?
N
Convert Child to countOnly
Update Sequence Value
2113
Y
Remove Child
2110

FIG. 21

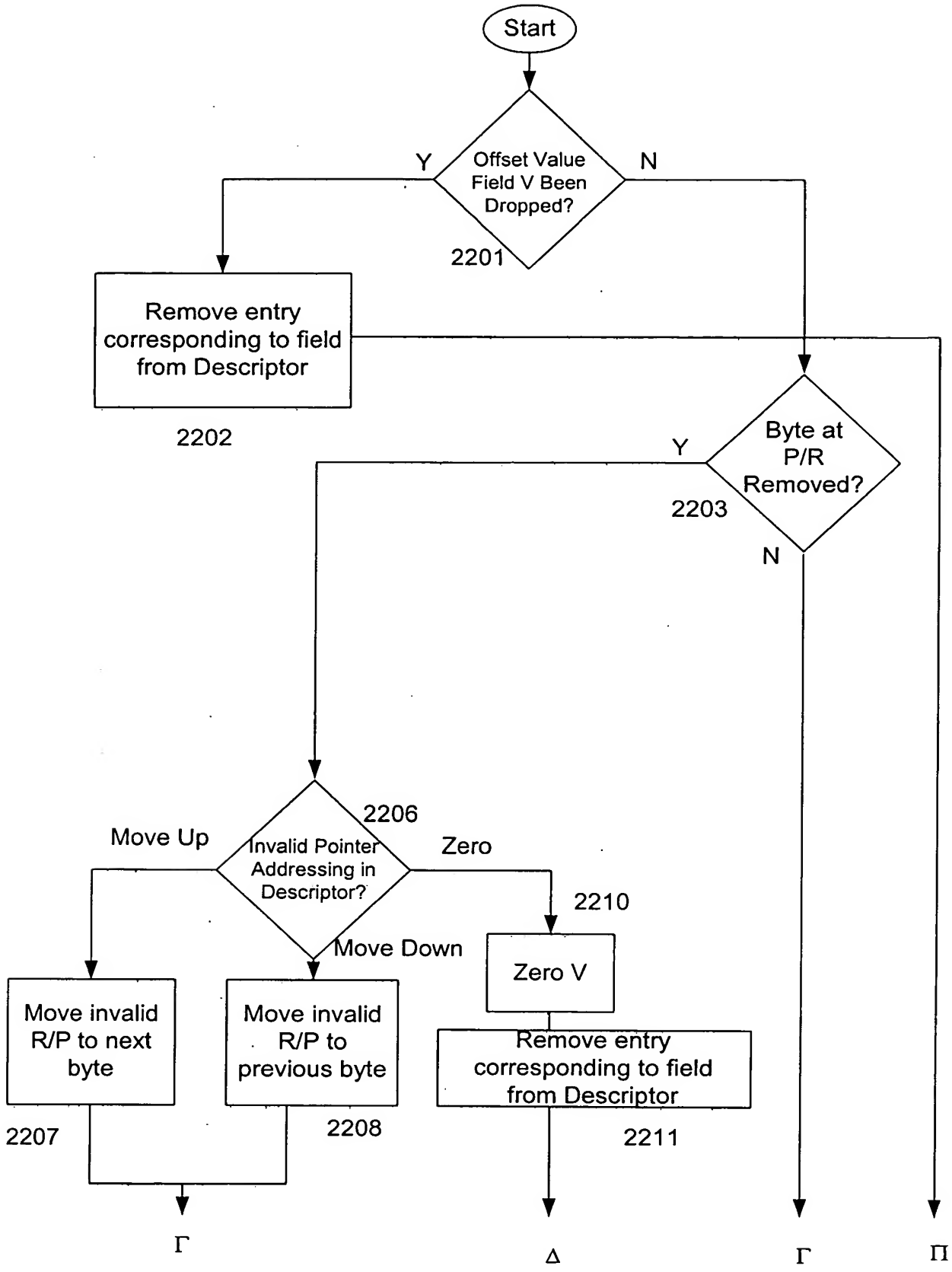

Start
Offset Value Field V Been Dropped?
Y
N
2201
Remove entry corresponding to field from Descriptor
2202
Byte at P/R Removed?
Y
2203
N
2206
Invalid Pointer Addressing in Descriptor?
Move Up
Zero
Move Down
2210
Zero V
Move invalid R/P to next byte
Move invalid R/P to previous byte
Remove entry corresponding to field from Descriptor
2207
2208
2211
Γ
Δ
Γ
Π

FIG. 22A

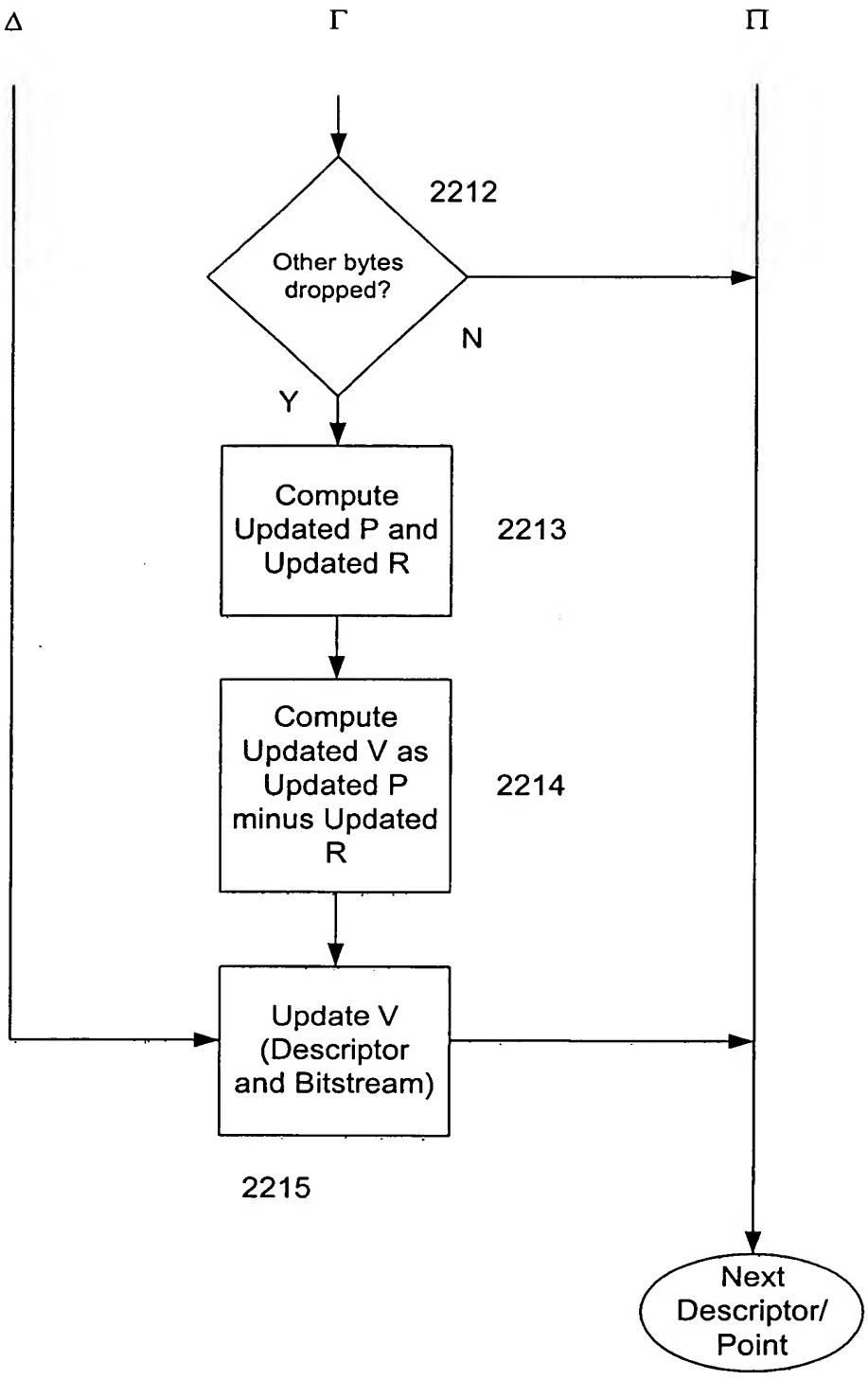

Δ
Γ
Π
2212
Other bytes dropped?
N
Y
Compute Updated P and Updated R
2213
Compute Updated V as Updated P minus Updated R
2214
Update V (Descriptor and Bitstream)
2215
Next Descriptor/ Point

FIG. 22B

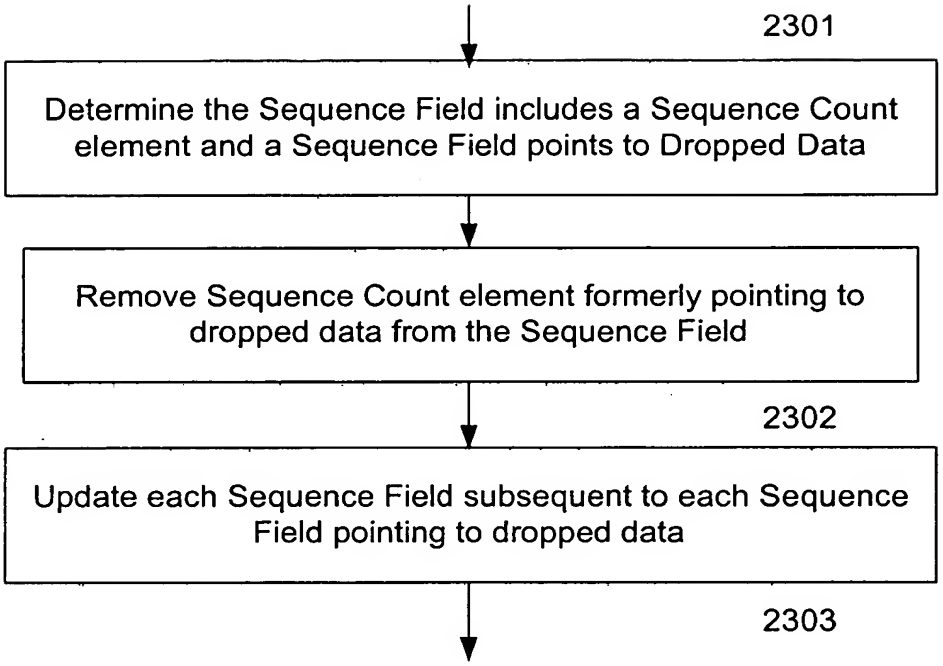


FIG. 23A

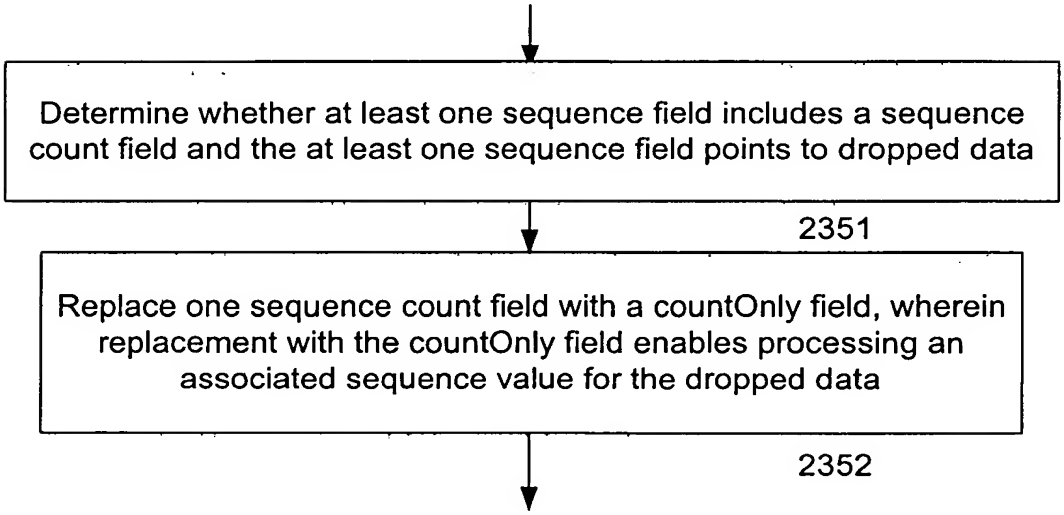


FIG. 23B

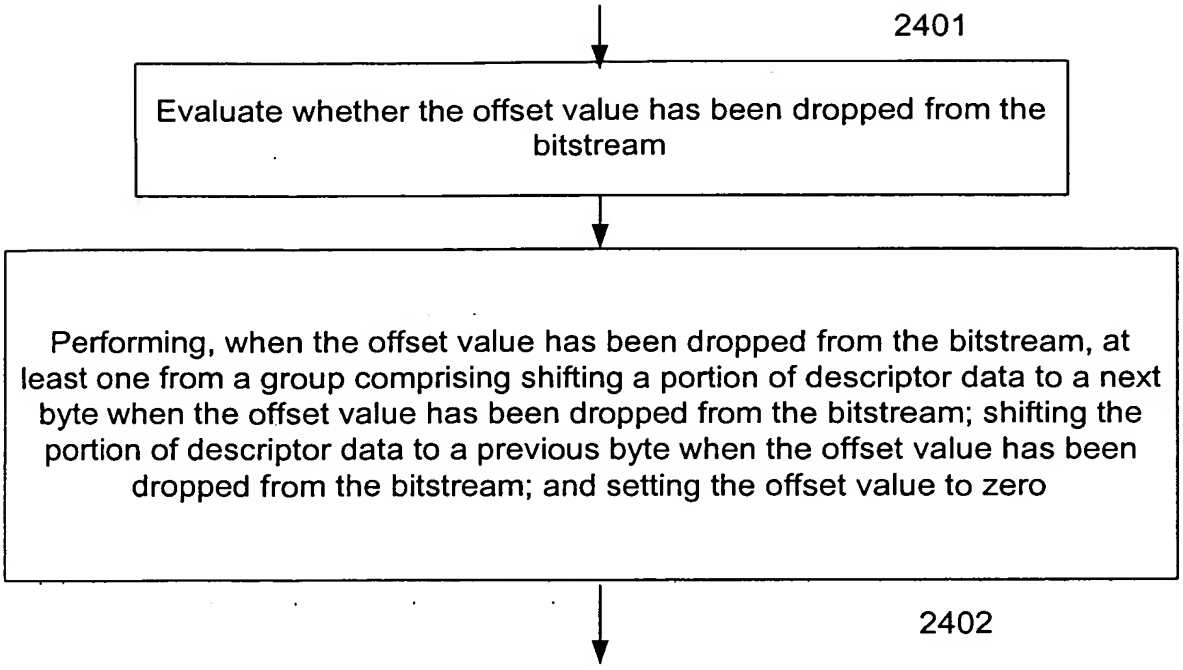


FIG. 24A

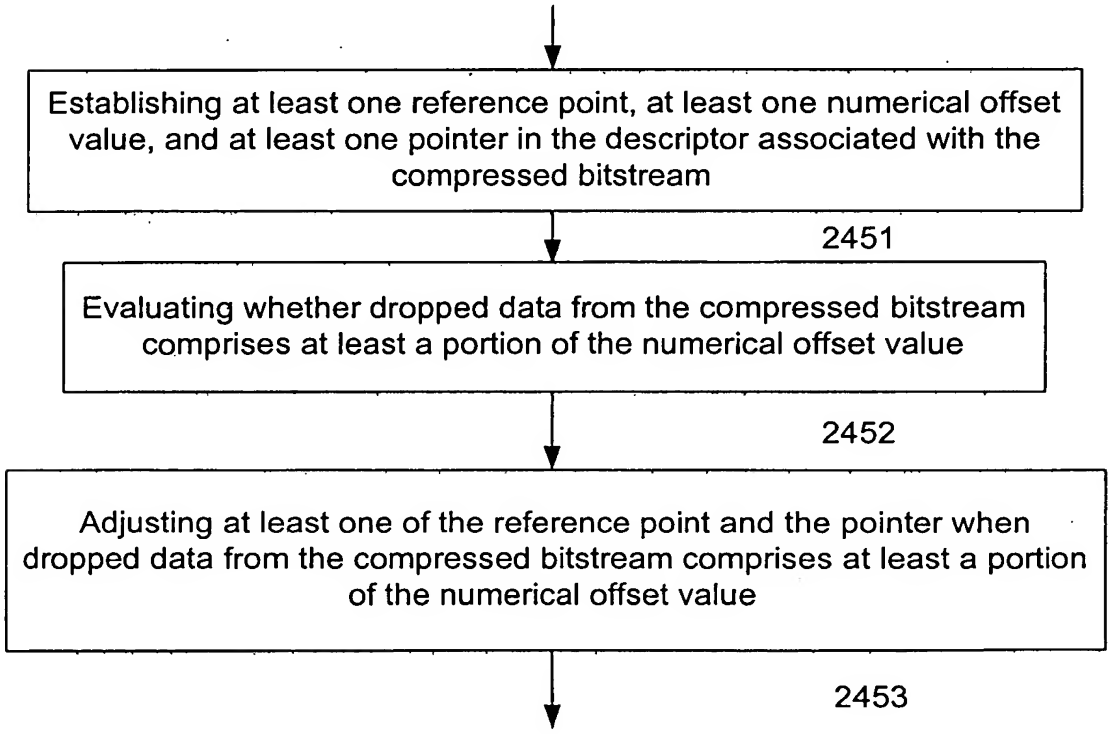


FIG. 24B

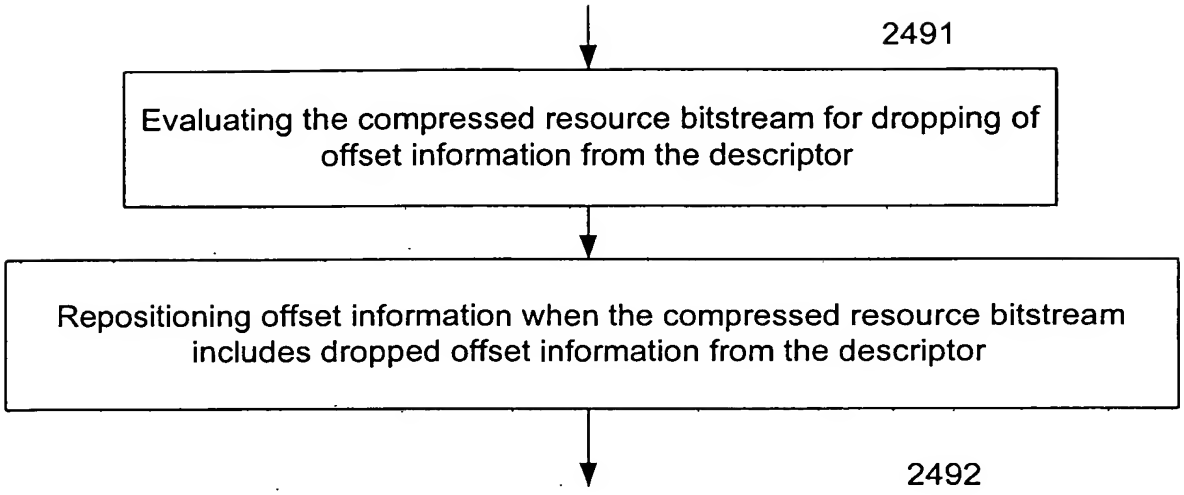


FIG. 24C

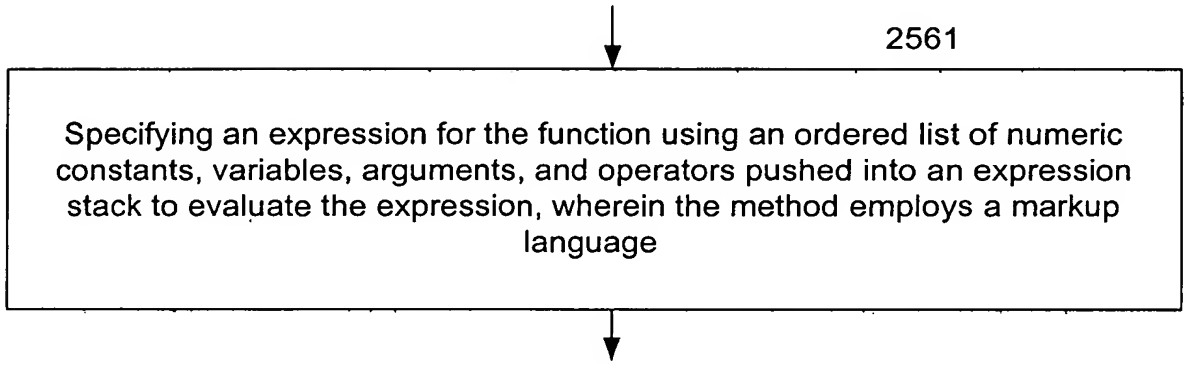


FIG. 25D

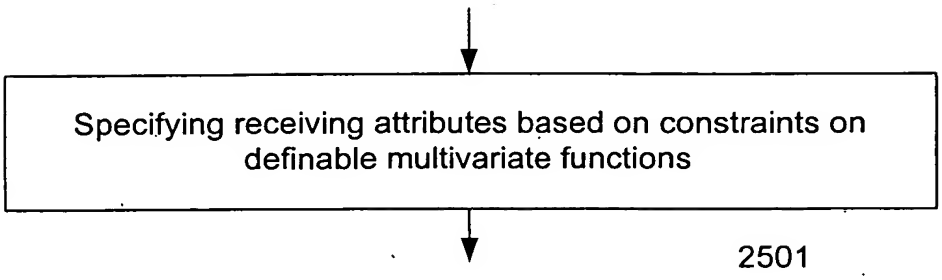


FIG. 25A

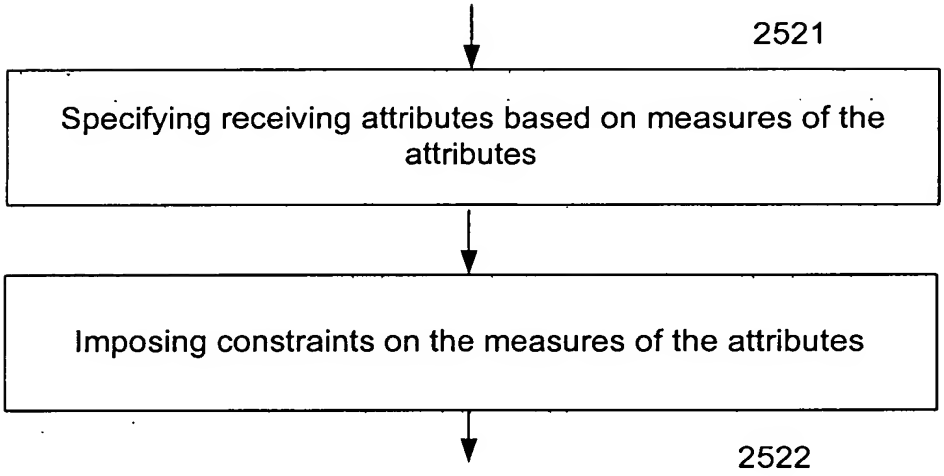


FIG. 25B

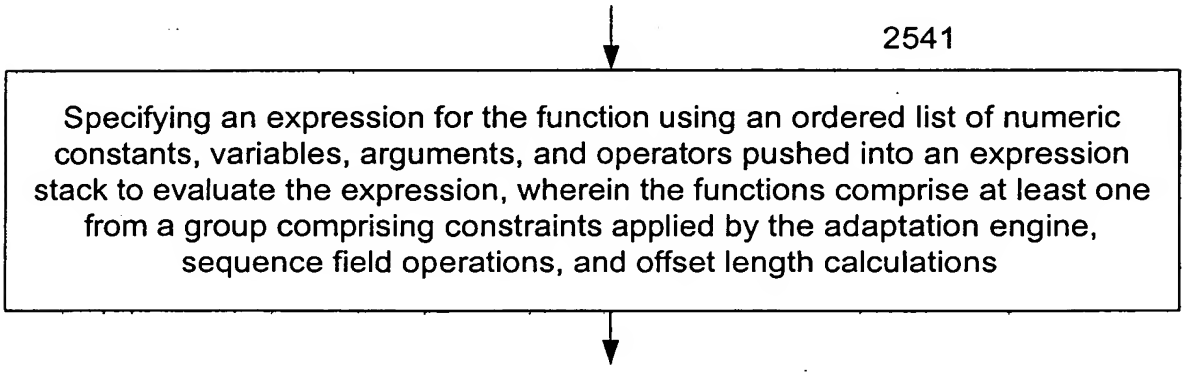


FIG. 25C